Gynerieae, a New Neotropical Tribe of Grasses (Poaceae)

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ABSTRACT. *Gynerium* was traditionally classified in the reed tribe Arundineae in the Arundinoideae, but recent molecular studies strongly support its affinities with the Panicoideae + Centothecoideae clade. A new tribe, the Gynerieae, is described to accommodate *Gynerium*.

Key words: Gynerieae, *Gynerium*, Neotropics, Poaceae.

Gynerium P. Beauvois, known as *caña brava* or giant reed, is a widespread, Neotropical, reed-like grass. The genus is characterized by its reedy habit, tightly distichous leaves, leathery blades with wide midribs, dioecy, and plumose pistillate synflorescences. The plants are probably the tallest among the grasses, excluding the woody bamboos, with some culms per population reaching 10(–15) m in height. This monotypic genus is distributed from southern Mexico to northeastern Argentina, as well as in the West Indies, and occurs along river banks and in swampy habitats. Locally, the culms are used for construction and decoration, and the peduncles are used as shafts for hunting arrows (Kalliola & Renvoize, 1994).

Due to the resemblance in habit and synflorescences, *Gynerium* has traditionally been classified with the other common reed-like grasses, including *Arundo* L. and *Phragmites* Adanson, in the tribe Arundineae (Kunth, 1833; Renvoize, 1981; Clayton & Renvoize, 1986; Conert, 1987; Dallwitz et al., 1999). In a few other classifications, however, *Gynerium* was included in other tribes such as the Festuceae (Hitchcock, 1914), Cortaderieae (Caro, 1982), or Danthonieae (Watson & Dallwitz, 1992). All of these classification systems were based on morphological and anatomical features.

Analyses of individual molecular sequence data sets provided conflicting results with respect to the phylogenetic relationships of *Gynerium*. Hsaio et al. (1998), based on nuclear ribosomal internal transcribed spacer (ITS) sequences, supported a monophyletic Arundinoideae, including *Gynerium*. Other taxa traditionally referred to this subfamily, such as *Thysanolaena* Nees, *Micraira* F. Mueller, and the danthonioid grasses, were also resolved as members of the Arundinoideae, although Hsiao et al. did not recover a monophyletic Arundineae. Outgroup selection, however, was limited to two species from outside of the PACC clade, and therefore alternative topologies were not rigorously tested. More detailed analyses of the PACC clade, as part of an analysis of ITS sequence data for the entire family (Hsiao et al., 1999), confirmed the placement of *Gynerium* within an arundinoid clade, but bootstrap values were very low. In contrast, Barker (1997), using plastome *rbc*L sequence data, placed *Gynerium* within a Panicoideae + Centothecoideae clade, either as sister to the Panicoideae or sister to *Thysanolaena* in the Centothecoideae, with moderate to good support values.

The Grass Phylogeny Working Group (GPWG, 2000, 2001) combined eight character sets, both molecular and morphological, in phylogenetic analyses of the entire Poaceae. Only four of these data sets (*rbc*L, *rpo*C2, ITS, and morphology) were available for *Gynerium*, but in the combined analyses, *Gynerium* was placed within the Panicoideae + Centothecoideae clade, whose monophyly was reasonably well supported (Fig. 1). Within this clade, *Gynerium* appears as sister to the Panicoideae, but with only moderate support values at best. Preliminary results based on molecular and morphological data from a more detailed study of the Panicoideae and Centothecoideae subclades corroborate the placement of *Gynerium* within the Panicoideae + Centothecoideae (Sánchez-Ken & Clark, 2000; E. A. Kellogg, pers. comm.), but its position remains unstable within this clade.

Gynerium is strongly supported as a member of the Panicoideae + Centothecoideae clade, but robust resolution of its phylogenetic position within this clade awaits further study. Nonetheless, the genus appears to be isolated from other tribes and genera in this clade, including the reed-like *Thysanolaena*, which is embedded within the Centothecoideae. We therefore propose tribal status for *Gynerium*, but cannot confidently place it in either the Panicoideae or Centothecoideae at this time.

Gynerieae Sánchez-Ken & L. G. Clark, tribus nov.
TYPE: *Gynerium* P. Beauvois.

Plantae perennes, rhizomatosae, dioeciae; culmis 2–10(–15) m altis; internodiis solidis. Folia disticha; vaginis quam internodiis longioribus, arctis, persistentibus; lam-

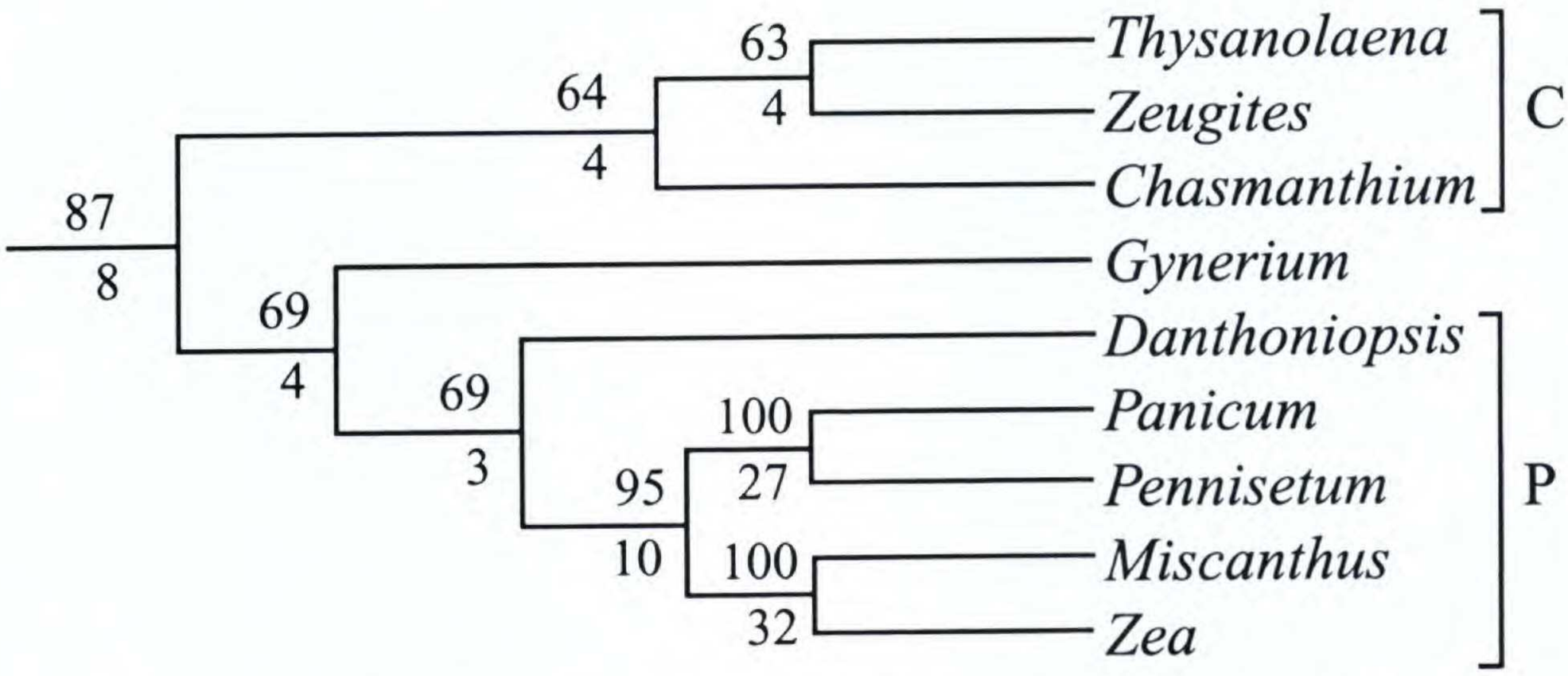

Figure 1. Phylogeny of the Panicoideae + Centothecoideae clade from GPWG (2001), with bootstrap values above the branches and Bremer support values below. C = Centothecoideae; P = Panicoideae.

inis (0.4–)1.5–2 m longis, coriaceis, articulatis, non pseudopetiolatis, costa 0.5–1.5 cm lata, plerumque conspicua. Synflorescentiae paniculatae, pistillatis plumosis. Spiculae pistillatae biflosculatae; glumis inaequalibus, inferiore membranacea, superiore coriacea, longiore quam flosculis; lemmatibus sursum villosis, ad apicem elongatis, attenuatis, non aristatis; lodiculis 2, truncatis, membranaceis; stylis 2, liberis; rachillae extensione carente. Spiculae staminatae 2- ad 4-flosculatae; glumis inaequalibus; lemmatibus glabris vel sparsim breviter pilosis; lodiculis 2; staminibus 2.

Plants perennial, rhizomatous, dioecious, staminate and pistillate plants similar in gross morphology. Culms 2–10(–15) m tall including the synflorescences; internodes solid. Leaves distichous; sheaths longer than the internodes, tightly enclosing the internodes, persistent; collar pilose on young leaves with rudimentary blades; ligules pilose; blades (0.4–)1.5–2 m long, leathery, articulated with the sheaths, disarticulating up to the middle of the culms, not pseudopetiolate, the midrib 0.5–1.5 cm wide, usually conspicuous. Synflorescences paniculate, the pistillate plumose. Pistillate spikelets with 2 florets, disarticulating above the glumes and between the florets; glumes unequal, 1- to 3-nerved, the upper glume longer and firmer than the lower glume, exceeding the florets; callus linear, glabrous; lemmas long silky pilose above, the apex elongated and narrowed, not awned; lodicules 2, free, truncate, membranous, sometimes bearing a few long hairs, faintly 2- or 3-nerved; stamens 2, rudimentary; styles 2, free; rachilla extension absent. Staminate spikelets with 2 to 4 florets, disarticulating below the distalmost floret, glumes and lowermost floret remaining attached; glumes subequal, membranous, 1-nerved; lemmas membranous, glabrous or sparsely short pilose, (0)1(3)-nerved; lodicules 2, free, faintly nerved, truncate; stamens 2; ovary abortive. Caryopsis oblong, hilum punctate. Chromosome number: $x = 11$.

The name is taken from the Greek *gyne*, "woman," and *erion*, "wool," referring to the pistillate spikelets. This tribe includes one genus with only one species, *G. sagittatum* (Aublet) P. Beauvois, which is distributed from the Caribbean and southern Mexico to tropical Argentina.

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